

AR31



Pier
**panarctic
oils ltd**



Tenth
Annual
Report
1977

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TEN YEAR HIGHLIGHTS

- 1968 — First sealift of drilling supplies and fuel.
- 1969 — Gas discovery at Drake Point.
- 1970 — Second gas discovery at King Christian Island.
- 1971 — Third gas discovery at Kristoffer Bay.
- 1972 — Fourth gas discovery at Hecla.
- 1973 — Fifth gas discovery at Thor Island.
- 1974 — First oil well completed on Cameron Island. First offshore well drilled from an ice platform. Satellite communication between Rea Point and Calgary established.
- 1975 — Sixth gas discovery at Jackson Bay and second oil well completed on Cameron Island.
- 1976 — Third oil well completed on Cameron Island. Designed special ice platform drilling rig.
- 1977 — Designed and planned first subsea completion below an ice platform and in 1978, completed a unique connection of a subsea wellhead to onshore production facilities for extended well testing.

FRONT COVER PHOTO

The 3-million pound, Hercules transportable Westburne Hi-Tower Rig No. 1 was specially designed and built to handle a complete subsea blowout preventer, and a subsea wellhead and christmas tree. Rig No. 1 was delivered to the Arctic in August, 1977, via Panarctic's Annual Sealift and is shown here drilling from the ice at Drake F-76, offshore the Sabine Peninsula of Melville Island, the location of Panarctic's first offshore well completion.

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PRESIDENT'S REPORT



The year 1977 saw a transition in Arctic Islands exploration from the initial exploration period to a concerted offshore exploration effort that is beginning in 1978 in high-grade areas indicated by the earlier work.

By the end of 1977, exploration in the Arctic Islands had resulted in the discovery of seven gas fields, six of which were discovered by Panarctic. Consultants for Panarctic estimate that the seven fields have marketable pipeline quality gas reserves of 12.7 trillion cubic feet. There is also an indication of possible commercial crude oil.

In the early years of exploration, drilling was confined to the onshore portion of the Islands where six of the gas fields were discovered. These fields lie onshore in whole or in part, or close to shore, and were discovered by wells drilled from land locations. However, the bulk of the gas reserves lie offshore.

Over the past 10 years initial exploration was carried out from Banks Island in the west to Ellesmere Island in the east. Arising out of this work, the most prospective area for oil and gas, as known at this time, is within the Western Sverdrup Basin, as shown on page seven. All of the known large structures in this area that can be drilled from the land have been drilled except for a few geologic leads which, after further study, may warrant wildcat drilling. The future lies in the offshore part of this highly prospective area where seismic work has identified a number of offshore geologic prospects, many similar to the seven gas fields already discovered.



The need to delineate the offshore portions of the gas fields already discovered, and the need to test offshore seismic structures, required the development of a method to drill offshore. Over the past five years, Panarctic has developed and refined equipment and techniques to drill offshore wells using modified land drilling rigs supported on artificially thickened ocean ice. Using this ice platform technique, Panarctic has drilled six offshore delineation wells to prove up the Drake and Hecla gas reserves. In addition, Panarctic made the first wholly offshore gas discovery at Jackson Bay, offshore Ellef Ringnes Island.

Panarctic, joined by Petro-Canada, Imperial Oil Limited and Gulf Oil Canada Limited, has made arrangements to acquire oil and gas rights in prospective offshore areas of the Sverdrup Basin. A new drilling rig specifically designed for drilling from ice was built and has been delivered to the Arctic. Measurement of ocean ice movements has been expanded to determine locations where ice platform drilling can be conducted safely. The stage has now been set for the present phase of exploration, which began in 1978 — the push into offshore exploration of these highly prospective areas.

In 1978, the first large offshore structure was drilled at Roche Point, north of the Hecla Gas Field, resulting in an eighth gas discovery.

Panarctic now has three drilling rigs available to drill wildcats on known large offshore geologic prospects. In addition, a fourth drilling rig will continue exploration in the Paleozoic Belt on the southern

fringe of the Sverdrup Basin, including another oil test on Cameron Island. The program is directed to the discovery of marketable quantities of gas and oil at the earliest date.

Panarctic, joined by Petro-Canada and The Alberta Gas Trunk Line Company Limited, has been working for the past two years planning and designing techniques and equipment to complete an offshore well for the taking of gas production in order to demonstrate that wells offshore the ice-covered Arctic Ocean can be completed and produced. After year end such a well, Panarctic Drake F-76, was successfully completed and connected to onshore production facilities by a flowline. The well is now production testing from onshore facilities.

Polar Gas Limited, sponsor of the project to market Arctic Islands gas, filed applications with Canadian regulatory authorities to build and operate a large-diameter gas pipeline to southern markets. Hearings are expected to commence in 1978. Negotiations are continuing with Petro-Canada on the possibility of marketing smaller initial quantities of liquefied natural gas at an earlier date.

It is gratifying to report that in areas where Panarctic is involved with the Federal Government, day-to-day dealings with the various government agencies have proceeded more smoothly than ever. During the year the government introduced legislation to regulate the disposition and development of federal oil and gas rights, the Canada Oil and Gas Act. The introduction of this legislation is a positive step. However, a number of as-

pects of this proposed legislation are considered undesirable, and Panarctic will be expressing its views in this regard before parliamentary committees. If exploration in Canada's frontier areas is to be expanded or even maintained, the Canada Oil and Gas Act, when eventually enacted, must encourage rather than discourage exploration by the oil and gas industry.

During the year, Mr. J. C. McBean resigned from the Board of Directors, and was replaced by Mr. R. G. Brawn, President of Turbo Resources Limited. It is desired to express appreciation for Mr. McBean's contributions during his tenure.

Again, it is appropriate to say that superb performances by Panarctic personnel have made the foregoing achievements possible. Sincerest appreciation is expressed.

Chas. R. Hetherington
President & Chief Executive
Officer



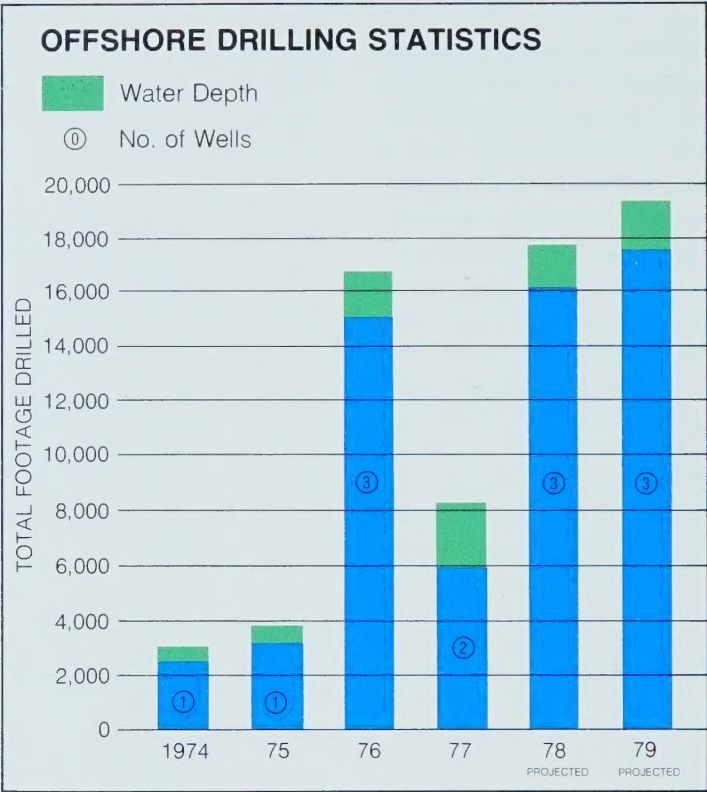
EXPLORATION

During the initial phase of offshore exploration in the Arctic Islands, which began in 1974 with the drilling of the West Hecla N-52 well from an artificially thickened ice platform, a number of important developments have set the stage for the next phase of Arctic Islands offshore exploration, which will begin in 1978.

Six of the seven offshore wells drilled to the end of 1977 have been shallow tests of 4,500 feet or less, and were drilled as delineation wells in known gas fields. These wells enabled Panarctic to prove and refine ice platform drilling and demonstrate the reliability of the technique. The wells, drilled in water depths ranging from 200 to 1,200 feet, have shown that with present equipment wells can be drilled in up to 1,500 feet of water. This allows exploration to take place in virtually all offshore areas of the Arctic Islands at a fraction of the cost of any other offshore drilling method.

Ice movement stations have been set out for the past seven years to monitor ice movements. The resulting measurements have pointed out areas where drilling from ice platforms can be conducted safely. Ice movement monitoring is continuing.

A new drilling rig, specifically designed for drilling from ice, was built and drilled its first offshore well in the spring of 1978 at the Drake F-76 offshore well completion. This well



was completed, connected to shore by a flowline, and flow tested to prove the technology for completing and producing offshore gas wells below the ocean ice.

Most importantly, in 1976 Panarctic, Imperial Oil Limited, Gulf Oil Canada Limited and Petro-Canada, farmed into 33 million acres of land under permit to Sun Oil Limited and/or Global Arctic Islands Limited. The significance of this farmout becomes apparent when it is realized that most of the permits lie in the offshore portion of the highly prospective Sverdrup Basin. Work by this group of companies, known as the Arctic Islands Exploration Group, is expected to result in the spending of \$120 to \$150 million on exploration by 1981, mainly in the offshore portion of the Sverdrup Basin.

Over the past three years an industry group of companies conducted a \$40 million, 10,400 mile geophysical reconnaissance program in offshore areas. This work resulted in the identification of a large number of prospects and leads, similar to the fields already discovered.

With all this groundwork laid, exploration will begin in the most prospective part of the Arctic Islands — the offshore portion of the Western Sverdrup Basin. In this area many large structures are known to exist, most of which could have substantial reserves of both oil and gas. The first of these large structures was drilled in the spring of 1978 and resulted in a gas discovery at Roche Point, located twenty miles northeast of the Hecla Gas Field.



Exploration Activity

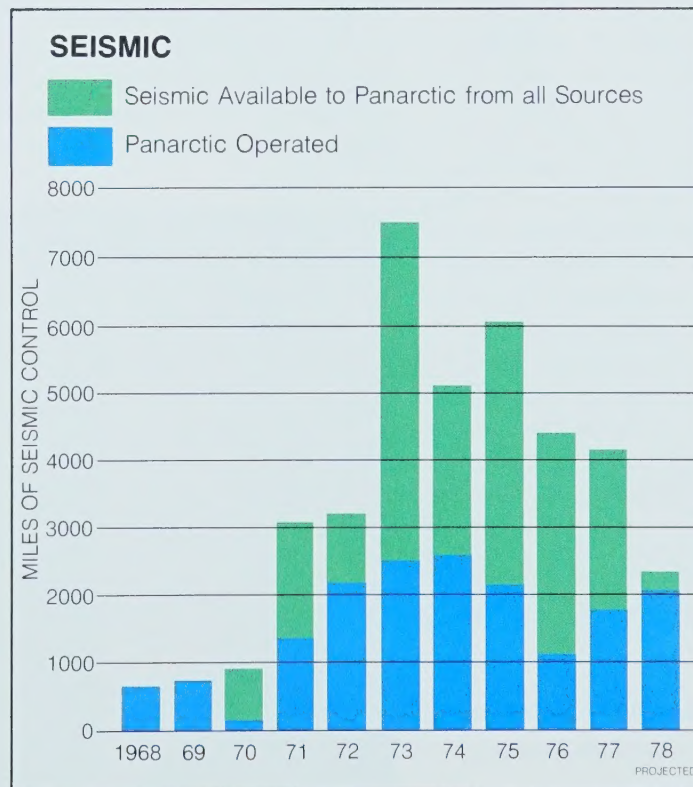
Drilling

Five rigs were under contract for parts of 1977, completing eight wells on acreage in which Panarctic has an interest. The number of feet drilled in 1977 was slightly less than in 1976, and is representative of the level of activity to be expected over the next several years. During 1977, Panarctic continued to be the only drilling operator in the Arctic Islands. For much of 1978, four drilling rigs will be utilized with the number of wells to be completed estimated at nine.

Seismic

At the end of 1977, Panarctic had acquired in excess of 35,000 miles of seismic data. During 1977, Panarctic-operated seismic crews shot 1,820 miles of seismic. Panarctic also obtained 2,350 miles of seismic through participation in an industry program, through participation in other group surveys, and by purchases from other companies.

During 1978, Panarctic will operate five seismic crews on behalf of itself and its partners, including the Arctic Islands Exploration Group. These crews will shoot over 2,000 miles of seismic lines. This program will be shot on land, on ice, and from a ship during the summer season.





Exploration Results

Drilling during 1977 was concentrated in two areas — in the vicinity of Cameron Island and the Bent Horn oil discoveries, and adjacent to the Drake Point and Hecla Gas Fields.

At Panarctic S.W. Hecla C-58, a Borden Island gas well was drilled from an ice platform in 1,000 feet of water. This well, located 9.5 miles southwest of the Hecla P-62 gas well, was drilled outside the structural closure of the Hecla gas field. It encountered a thin, poor quality, gas-bearing Borden Island Sandstone, confirming that the Hecla gas field is at least in part a stratigraphic trap.

Panarctic N.E. Drake P-40, the first well drilled by the Arctic Islands Exploration Group, was drilled 20 miles offshore in 1,179 feet of water. This well, for reasons of safety and environmental protection, was purposely drilled outside of structural closure as there was a possibility that the gas/water contact at this location could be similar to that found at the Drake I-55 well. Had this been the case the well could not have been drilled safely within the structural closure due to high pressure. Drake P-40 encountered excellent reservoirs in the Borden Island but the sandstones were water-bearing. Further drilling will be required in this area as there are several remaining fault blocks that could be gas-bearing.

Panarctic et al Depot Island C-44 was the second Arctic Islands Exploration Group well drilled in 1977, and was an attempt to extend the Hecla-type stratigraphic trap 42 miles to the west on Northern Melville Island. This well was unsuccessful in that it was outside the limits of the Borden Island Sandstone. An offshore well, drilled in the spring of 1978 at Cape Grassy I-34 was also unsuccessful but did encounter a good development of Borden Island Sandstone. The occurrence of this sand enhances a large block of Panarctic lands lying between this well and the Hecla Gas Field.

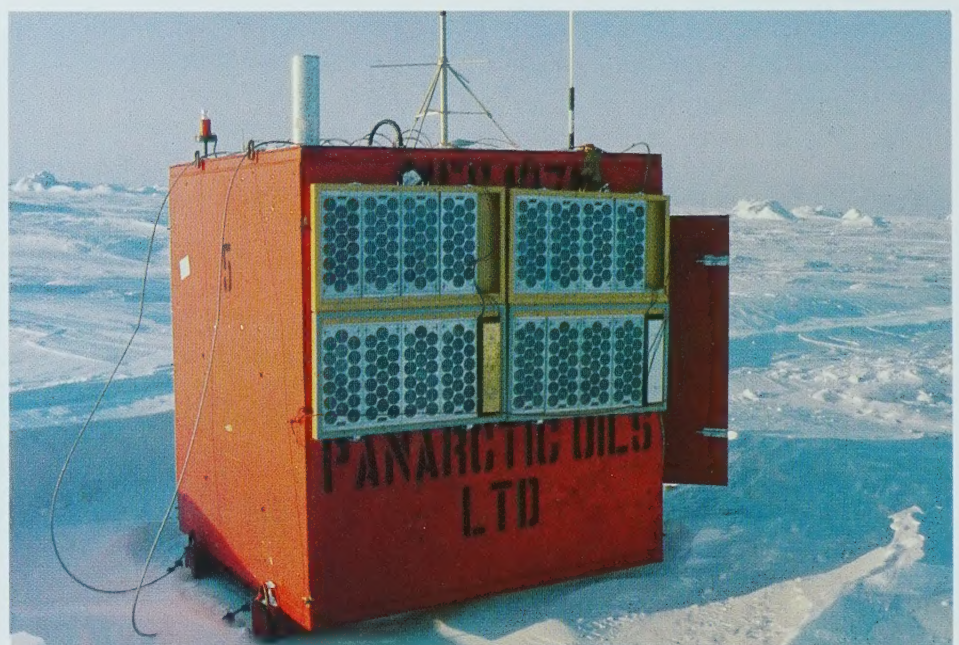
Three wells were drilled in the Bent Horn area in 1977, and two others were drilled on older Paleozoic prospects in the general Cameron Island area. All but one had shows of oil or gas, however none in commercial quantities. Lack of good porosity was the major problem with these wells. Panarctic still feels this area deserves more exploration, for the three oil wells at Bent Horn show that where porosity

is developed the wells are highly productive. Panarctic is presently drilling at Cape Fortune, on Cameron Island, on an anomaly adjacent and similar to the Bent Horn field.

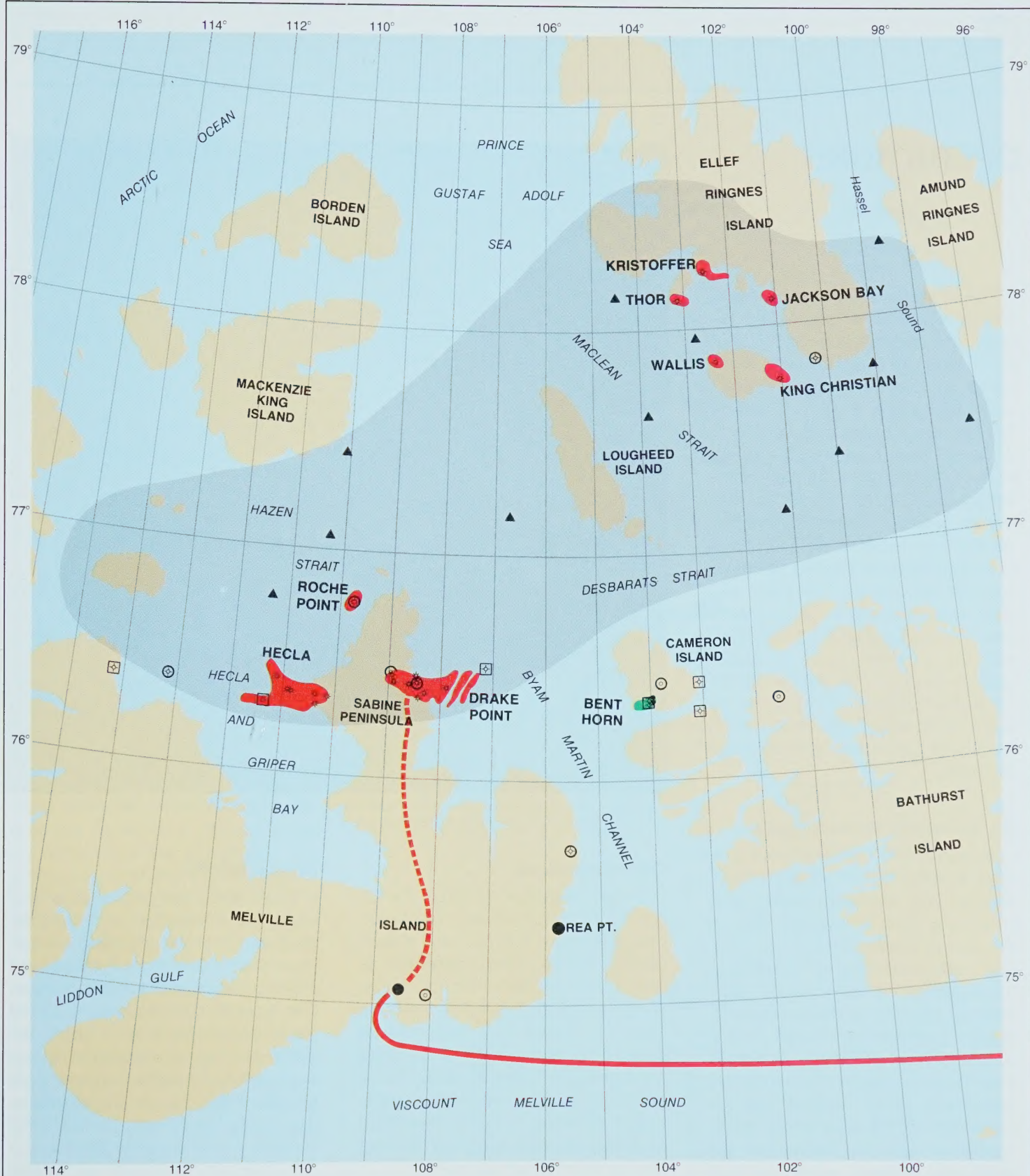
Petro-Canada has served as a stimulus in getting several lower Paleozoic wells drilled during the present drilling season by farming in to Panarctic's partners, thereby assuring the financing of these key wells.

Arctic Islands Exploration Group

In 1977, the Arctic Islands Exploration Group completed its first full year of exploration with the drilling of two wells, the shooting of 1,465 miles of seismic lines and the monitoring of six ice movement stations in the offshore portion of the Sverdrup Basin. In 1978, two Arctic Islands Exploration Group wells were drilled, including the new gas discovery at Roche Point, 12 ice stations are being monitored and an estimated 1,500 miles of seismic will be shot.



One of 12 Arctic Islands Exploration Group stations monitoring ice movement in Hecla and Griper Bay.



LEGEND

■ GAS FIELD

■ OIL FIELD

▲ ICE MOVEMENT STATION

■ HIGHGRADE AREA OF WESTERN SVERDRUP BASIN

○ LOCATION OR DRILLING WELL

◇ DRY & ABANDONED WELL

✱ GAS WELL

• OIL WELL

□ 1977 WELLS

○ SPRING 1978 WELLS

ARCTIC PILOT PROJECT

--- GAS PIPELINE ROUTE

— LNG TANKER ROUTE

● LIQUEFACTION FACILITY AT BRIDPORT INLET



OPERATIONS

The Operations Division conducts drilling activities in the Arctic Islands and provides support for all of the Company's Arctic activities. Using up to seven rigs simultaneously, to the end of 1977, a total of 764,699 feet of hole had been drilled in 84 wells onshore plus seven wells drilled from artificially thickened offshore ice platforms. Rig moves between locations remarkable for their extreme isolation have been effected with various combinations of helicopters, Hercules aircraft and overland all-terrain vehicles. Through a single co-ordinated multi-rig operation, costs for exploration activities in the Arctic Islands have been low in comparison to costs which would result from a multiplicity of operators working independently.

Ice Movement Measurements

A program to measure ice movement in the offshore areas North of Melville and Bathurst Islands, and stretching from Norwegian Bay in the east to Hazen Strait in the west, has been conducted at 14 stations. Ice movement is detected by reference to orbiting satellites. This operation provides information having a reliability not previously available. Preliminary results from the ice movement study indicate that ice movement in the area under investigation is such that drilling from ice platforms in deep water far from shore is practical with the equipment currently in use.



Panarctic Twin Otter aircraft flying over fuel supply ship "Lunni". During the 1977 Sealift, "Lunni" delivered 3.8 million gallons of fuel to Rea Point.

Communications

A new standard of reliability for communications between the Arctic operations and Calgary was established in 1974 by the installation at Rea Point of facilities to utilize Canada's Anik I communications satellite. These facilities provide simultaneous teletype and voice transmission between Rea Point and Calgary on a continuous basis. Communication between Rea Point and the various outlying drilling sites is maintained by radio.

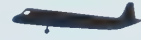
Annual Sealift

Each year during late August and early September fuel and supplies for support of the following operating season are shipped to major staging bases in the Arctic Islands. The cost of moving freight to the Arctic Islands by ship is under ten cents per pound, compared to approximately 40 cents per pound for freight moved by air. Sealift resupply during the 10-year period, 1968 to 1977, has been 277,000 tons.



Air Transportation

The movement of personnel and supplies by air has always been a major part of the operations support program. Early operations utilizing company-owned aircraft have, in later years, been modified to make more extensive use of Pacific Western Airlines' jet services in combination with company-operated de-Havilland Twin Otters. In the initial ten years of operation, 1968 to 1977, over 53,500 hours were flown with Company aircraft, supplemented by 2,175 hours flown with Pacific Western Airlines' jets. The application of the larger, faster jets is reflected in reduced flying hours in recent years.



YEAR	TWIN-OTTER FLYING HOURS	ELECTRA/727 FLYING HOURS
1968	500	—
1969	2,100	—
1970	2,900	2,300
1971	3,400	1,900
1972	4,400	2,500
1973	4,900	3,500
1974	4,400	4,500
1975	4,800	2,400
1976	4,000	1,200
1977	4,700	1,300

Drilling

Drilling efficiency and safety continue to improve as information on Arctic problems is accumulated and studied. However, costs are increasing due to inflationary pressures and high demand for drilling personnel and equipment in Alberta, coupled with Panarctic's aggressive moves into offshore areas on reinforced ice platforms. The emphasis on offshore drilling is accelerating due to the combination of definition of attractive offshore objectives plus growing confidence in the safety, capability and economics of the offshore ice platform drilling system pioneered by Panarctic. The results of early ice platform drilling prompted the design and commissioning of a more sophisticated ice platform rig exhibiting essentially all of the capabilities of an offshore floating drilling rig. This unit, Westburne Hi-Tower Rig No. 1, was transported to the Arctic in 1977 and drilled its first offshore well in early 1978.



YEAR	FOOTAGE DRILLED	AVERAGE COST PER FOOT
1969	29,000	\$241
1970	41,000	226
1971	64,000	250
1972	129,000	214
1973	134,000	250

	Onshore/Offshore		Onshore/Offshore	
1974	107,000	3,000	\$268	\$997
1975	109,000	4,000	322	713
1976	58,000	17,000	291	708
1977	62,000	8,000	462	748



YEAR	SHIPS CHARTERED	PANARCTIC TOTAL TONNAGE
1968	2	6,000
1969	4	20,000
1970	2	15,000
1971	3	22,000
1972	5	41,000
1973	5	43,000
1974	4	41,000
1975	3	32,000
1976	3	22,000
1977	4	35,000



This specially-designed plow dug the 5 feet deep pipeline trench in the ocean floor.



Gas flare at wellhead indicates the successful completion of the Drake F-76 well.

Special Projects

Drake F-76 Subsea Completion

A project, funded by Panarctic, Petro-Canada and The Alberta Gas Trunk Line Company Limited, was undertaken to develop a system for production of subsea wells in an ice-infested environment.

Simultaneously with the drilling of the Drake F-76 well in 180 feet of water, 4,000 feet from shore, a complex flowline bundle was constructed onshore. The flowline bundle was pulled offshore into the vicinity of the subsea wellhead and successfully connected by a unique lateral deflection procedure never previously utilized. This procedure for flowline connection exhibits great promise for application to the production of Panarctic's offshore under-ice reserves and for world-wide application to deep-water well connection beyond the limits of diver accessibility.

Protection of the flowline bundle from ice scour where it crosses the



Subsea Completion Manifold, attached to the flowline bundle which was connected to the subsea christmas tree.

foreshore area is afforded by placement of the line in a ditch prepared by a large plow specifically developed for use at this site. Additional protection from ice scour is provided by the installation of a refrigeration system which will develop a "frost bulb" around the buried pipe. At the shoreline an ice berm has been installed out to 15-foot water depth by artificially thickening the ice until it grounded to form a fixed and permanent projection of the shoreline overlying the pipe to protect it from ice floes.

The successful execution of the Drake F-76 subsea completion, and the tie-in to shore-based control and production facilities, represents an important step in the offshore exploration program. It also provides an opportunity to conduct long-term production testing to ascertain reservoir properties, and to investigate problems that might arise in commercial production.



Underwater "wet" christmas tree assembly into which flowline bundle was connected. The diverless connection was accomplished from the rig hydraulically by remote control, and monitored by electronic sensors and underwater television.



Gas flare at onshore facility during flowline bundle testing indicated an absolute open flow potential of 320 million cubic feet of gas per day.



LAND AND ADMINISTRATION

Land

At December 31, 1977, Panarctic held an interest in a total of 71.4 million gross permit acres, representing a net position of 27.3 million*permit acres, including 970,396 permit acres held under applications for oil and gas leases. At the end of 1977, Panarctic was the operator responsible for the administration of 1,716 individual permits and leases in the Arctic Islands.

During 1977, the Company pursued its policy of endeavoring to increase exploration in the Arctic Islands through farmouts to other companies and through other exploration agreements.

Panarctic was successful in negotiating an agreement with Petro-Canada wherein that company participated in the drilling of the Sophie Point and Beverley Inlet wells. Petro-Canada has also become an equal partner with Panarctic in the exploration of two large blocks of land located on Melville Island currently under option to the Company.

Negotiations were completed to acquire varying working interests in a total of 962,462 gross acres lo-

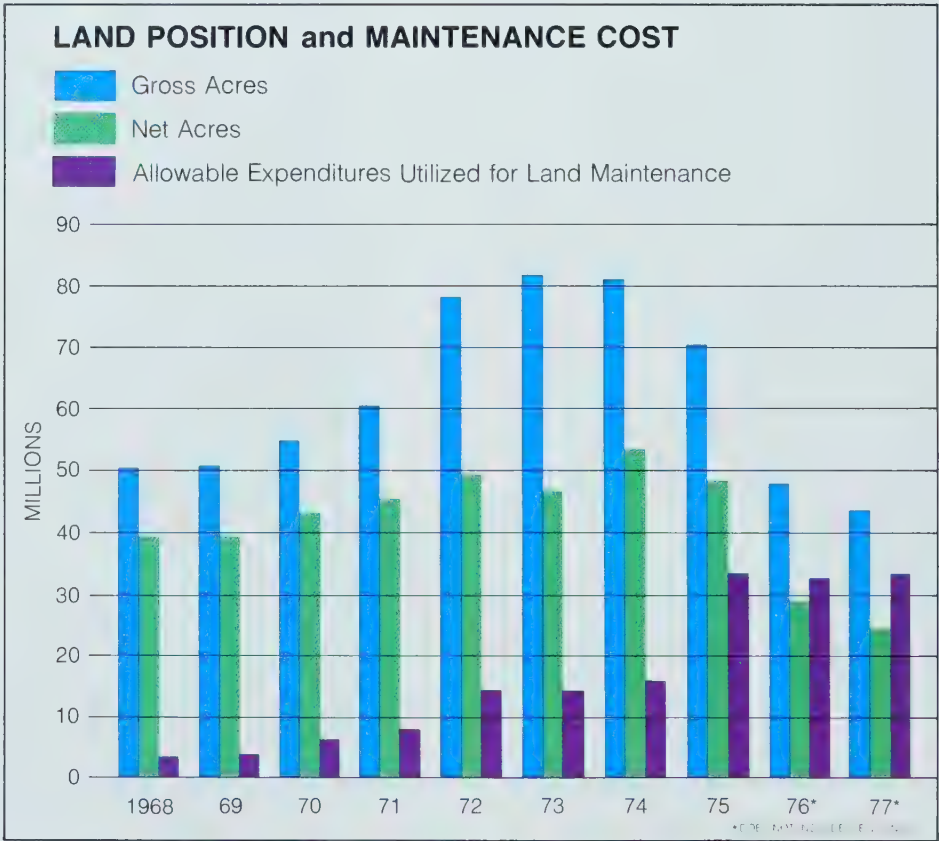
cated on northeast Banks Island, Isachsen Peninsula on Ellef Ringnes Island and northeast of the Sabine Peninsula in Hazen Strait. These acquisitions increased Panarctic's net holdings by 181,178 acres.

Panarctic's policy of selectively surrendering acreage resulted in a reduction of the Company's land holdings of 6.3 million gross acres or 5.0 million net acres during 1977.

The graph below shows Panarctic's gross and net land holdings by years for the period 1968 to 1977 inclusive, and the corresponding costs to maintain those lands. It is evident that, since 1975, the Company has incurred rapidly escalating land maintenance costs even though substantial reductions in its land holdings have been made during the same period.

In December, 1977, Bill C-20, an Act to regulate the disposition and development of oil and gas rights of Canada lands, received first reading in the House of Commons. Issuance of regulations made pursuant to this Act, if and when it is passed, will provide Panarctic and the rest of the petroleum industry with a base from which to structure long range plans for exploration and development projects. However, the proposed legislation contains many new provisions, and it is questionable whether these legislative elements, purported to be designed to promote the early assessment of Canada's frontier oil and gas reserves, will accomplish that objective.

*Subject to 10% net profits interest. Includes 2.4 million net permit acres to be earned under Arctic Islands Exploration Group agreement.





Environment

In conjunction with increased drilling activity on the Sabine Peninsula of Melville Island, four site-specific environmental research programs were conducted. The first study, a critical review and status report on existing literature related to the Peninsula, determined future environmental programs to be initiated.

The major program undertaken as a result of this review was a baseline biological reconnaissance study covering the Drake and Hecla gas fields on the Sabine Peninsula. This study provided a clear insight into biological and terrestrial processes found in the area. The third program, an archaeological overview, was carried out in co-operation with Polar Gas. No archaeological sites were discovered. Finally, a baseline biological study was conducted in association with the Drake F-76 offshore well completion project to determine the nutrient content of the oceans.

Arising out of these programs Environmental Impact Statements were prepared in support of the proposed Polar Gas Pipeline and Petro-Canada's Arctic Pilot Project.

With the possibility of developing marketable quantities of crude oil on Cameron Island, Panarctic reviewed the available environmental literature to assess the adequacy of the data base. Study programs were developed to satisfy data gaps and provide for adequate lead time for the preparation of a thorough Environment Impact Assessment.

Since 1974, Panarctic has expanded its efforts to minimize disturbance to terrain and biological systems by conducting environmental assessments of all its High Arctic operations. 1977 saw not only the continuation of the yearly environmental summaries, but also a total review of all environmental studies relating to Panarctic's wellsites and staging areas. The frequent monitoring of environmental changes as a result of exploration activities facilitates recommendations to further minimize environmental disturbances from future activities.



Rocky shorelines are characteristic of Arctic Island coastal environments.



Personnel

As of December 31, 1977, Panarctic had 165 employees, of whom 47 were Arctic based, five Edmonton based, and 113 Calgary based.

Arctic based employees, flown to and from Edmonton, work fourteen days in the Arctic followed by seven days leave. While in the Arctic the standard work schedule is twelve hours a day, seven days a week. Arctic based employees fill the positions of superintendents, supervisors, foremen, storesmen, partsmen, pilots, aircraft mechanics, and communication technologists. Drilling and seismic crews, and all other Arctic staff requirements, totalling 600 employees during peak periods, are provided by outside contractors.

Native Employment Program

In December, 1971, the Company implemented a special transportation program which made Arctic Islands employment accessible to residents of Pond Inlet and Arctic Bay, on Baffin Island. Although these two settlements are 600 miles southeast of Panarctic's Rea Point base camp, studies showed that these two communities were the closest to Panarctic jobsites where sufficient willing and able work forces were available to make an employment transportation program feasible.

Through practical experience and on-the-job training, Panarctic's Inuit employees are being given the opportunity to upgrade their skills and progress from labour positions into semi-skilled and skilled positions. During 1977, 83 Inuit were employed. These men were em-



Welder employed by one of Panarctic's contractors through the Native Employment Program.

ployed as equipment operators, roustabouts, labourers, carpenters, welders, and radio operators.

In addition to being paid on the same wage scale as their southern counterparts and working on the same work rotation schedule, Panarctic's Inuit employees are insured for \$20,000 Accidental Death and Dismemberment and \$800 per month Long Term Disability in the event of an accident while working.

During 1977, \$527,456 in salaries were paid to employees from Pond Inlet and Arctic Bay. A total of 33,588 miles were flown by Company operated aircraft to transport these employees to and from jobsites.

Since inception of the Native Employment Program, over \$3 million in salaries has been paid. The benefits of the influx of this income are evidenced in the improved standard of living being enjoyed by these employees and their communities.



GAS MARKETING

Polar Gas Project

The Polar Gas Project was formed in 1972 to find the best means of transporting the natural gas discovered in Canada's Arctic Islands to southern markets, and to do so in a manner that would be economically, environmentally and socially acceptable to Canadians.

Participants in the Polar Gas Project are: TransCanada PipeLines Limited, a Canadian company acting as the project manager; Panarctic Oils Ltd., a Canadian company which is 45 per cent owned by Petro-Canada; Petro-Canada, which is owned by the Government of Canada; Ontario Energy Corporation, which is owned by the Government of Ontario; Pacific Lighting Gas Development Company, and Tenneco Oil of Canada Ltd., both subsidiaries of U.S. companies. Participants in the Polar Gas Project

continue to sponsor ongoing engineering and feasibility studies.

Four participants — TransCanada PipeLines, Panarctic Oils, Ontario Energy Corporation and Tenneco Oil — have joined in sponsoring applications for the necessary approvals to construct and operate a natural gas pipeline. These applications by Polar Gas Limited were filed with the National Energy Board and the Department of Indian Affairs and Northern Development on December 21, 1977.





Arctic Pilot Project

A group comprised of Petro-Canada, The Alberta Gas Trunk Line Company Limited and Melville Shipping Limited, continued feasibility studies for a liquefied natural gas (LNG) marketing system to connect Arctic Islands gas to southern markets. The system presently under examination contemplates transporting gas from the Drake Point field to southern Melville Island by pipeline, liquefaction of the gas in a plant at this location, and the transportation of 250 million cubic feet per day of liquefied natural gas by ice-breaking tankers to eastern market areas.



Summer, 1977, was exceptionally warm in the Arctic as is evidenced here by the large areas of open water off Melville Island.



FINANCIAL

In 1977, expenditures under the direct administration of Panarctic amounted to \$69.1 million, an increase of \$30.3 million over 1976. The first full year of exploration operations under the Arctic Islands Exploration Group Agreement, and expenditures related to the completion of the first Arctic offshore gas well and connection to onshore production facilities, were the main factors in this significant increase. Of the 1977 expenditures, \$22.3 million were provided by the company's shareholders, \$10.2 million by Home Oil Company Limited under an equity purchase agreement and the major portion of the balance from joint venture partners.

On a cumulative basis the Arctic Islands Exploration Group has expended \$26.1 million in exploration work. These expenditures are

against an \$80 million commitment by the Group to earn 60% of the interest of Sun Oil Limited and/or Global Arctic Islands Limited (Panarctic share 22%) in some 33 million gross acres in the high Arctic.

Under an Agreement entered into in 1976, Home Oil Company Limited is to spend \$30.5 million over a three-year period to acquire 2,441,794 common shares of Panarctic. In 1977, \$10.2 million was spent against this commitment and Home was issued 813,931 shares.

In 1977, financing of \$35 million was arranged through an offering to shareholders. Of this amount, \$22.3 million was expended during the year, leaving \$12.7 million available from this source which, together with the commitment by Home Oil Company Limited of \$10.2 million, will provide \$22.9 million toward Panarctic's 1978 exploration program. In order to complete the planned program, additional financing will be required in 1978.

Operating and Financial Summary

(All figures in thousands, except number of employees)

Year	Exploration Expenditures Capitalized				Share Capital as at Dec. 31		Employees		Land Holdings* at Dec. 31	
	Geological and Geophysical	Drilling	Other	Cumulative to Dec. 31	Number of Shares	Capital	Number at Dec. 31	Payroll and Benefits	Gross	Net
1977	\$ 4,461	\$19,895	\$4,144	\$200,739	44,514	\$215,550	165	\$3,856	71,400	27,300**
1976	7,026	20,416	4,936	172,239	40,900	170,376	163	4,168	77,700	32,300**
1975	9,193	21,591	3,166	139,861	38,900	145,376	224	4,359	70,834	48,610
1974	11,632	9,458	1,825	105,911	37,380	126,376	237	3,852	81,613	53,704
1973	8,822	10,289	1,575	82,996	35,380	101,376	242	3,531	82,033	47,114

*Subject to 10% net profits interest

**Includes 2.4 million net permit acres to be earned under The Arctic Islands Exploration Group agreement.



PANARCTIC OILS LTD.

Balance Sheet

ASSETS

	<i>December 31</i>	
	1977	1976
Current assets:		
Cash (including term deposits)	\$ 421,000	\$ 2,000
Accounts receivable	10,926,000	2,335,000
Exploration expenditures recoverable from shareholders	1,180,000	2,000,000
Inventory of supplies	9,945,000	10,207,000
Prepaid insurance and sundry advances	229,000	260,000
	22,701,000	14,804,000
Capital assets, at cost:		
Equipment (Note 2)	15,960,000	11,192,000
Less: Accumulated depreciation	(7,671,000)	(7,216,000)
	8,289,000	3,976,000
Petroleum and natural gas rights	525,000	525,000
Exploration expenditures	200,739,000	172,239,000
	209,553,000	176,740,000
Other assets:		
Exploration and drilling expenditures to be incurred by Panarctic Participants	12,651,000	—
Funds held in trust for Panarctic Participants (per contra)	136,000	77,000
Share purchase notes receivable from shareholders	250,000	250,000
Deferred charges	908,000	—
	13,945,000	327,000
	\$246,199,000	\$191,871,000



LIABILITIES

	December 31	
	1977	1976
Current liabilities:		
Bank indebtedness	\$ 4,000,000	\$ 2,752,000
Accounts payable and accrued liabilities	9,124,000	3,791,000
Current portion of long-term debt	1,226,000	726,000
	<u>14,350,000</u>	<u>7,269,000</u>
Funds held in trust for Panarctic Participants (per contra)	<u>136,000</u>	<u>77,000</u>
Long-term bank loans (Note 4)	<u>16,163,000</u>	<u>14,149,000</u>
 SHAREHOLDERS' EQUITY		
Share capital (Note 5)		
Authorized —		
60,000,000 common shares of no par value		
Issued —		
44,514,031 shares (1976 — 40,900,100 shares)	<u>215,550,000</u>	<u>170,376,000</u>
 Commitments (Note 7)		
 Approved by the Board:		
  Director		
  Director		
	<u>\$246,199,000</u>	<u>\$191,871,000</u>



PANARCTIC OILS LTD.

Statement of Exploration Expenditures Capitalized

	Year ended December 31		From inception to December 31
	1977	1976	1977
Geological and Geophysical	\$ 4,461,000	\$ 7,026,000	\$ 59,818,000
Drilling	19,895,000	20,416,000	120,679,000
Administrative and general	2,442,000	3,347,000	16,346,000
Interest expense			
On long-term debt	1,380,000	1,453,000	2,833,000
Other	361,000	275,000	2,246,000
Interest income	(39,000)	(139,000)	(1,183,000)
	<u>\$28,500,000</u>	<u>\$32,378,000</u>	<u>\$200,739,000</u>

Statement of Changes in Financial Position

	Year ended December 31	
	1977	1976
Funds were provided from:		
Issuance of capital stock —		
To the Government of Canada for an undertaking to make cash investments	\$ 1,869,000	\$11,250,000
To Participants for exploration commitments	33,131,000	13,750,000
To Home Oil Company Limited for exploration expenditures incurred	10,174,000	—
	<u>45,174,000</u>	<u>25,000,000</u>
Exploration expenditures incurred (to be incurred) by Participants	(12,651,000)	1,234,000
Long-term bank loans	3,240,000	2,875,000
Proceeds on disposal of equipment	466,000	1,309,000
	<u>36,229,000</u>	<u>30,418,000</u>
Funds were used for:		
Exploration expenditures	28,500,000	32,378,000
Less: Depreciation and other non-cash charges and credits	(987,000)	(801,000)
	<u>27,513,000</u>	<u>31,577,000</u>
Purchase of equipment	5,766,000	515,000
Petroleum and natural gas rights	—	11,000
Deferred charges	908,000	—
Reduction of long-term debt	1,226,000	726,000
	<u>35,413,000</u>	<u>32,829,000</u>
Increase (decrease) in working capital	816,000	(2,411,000)
Working capital at beginning of year	7,535,000	9,946,000
Working capital at end of year	<u>\$ 8,351,000</u>	<u>\$ 7,535,000</u>
CONSISTING OF:		
Current assets	\$22,701,000	\$14,804,000
Current liabilities	(14,350,000)	(7,269,000)
	<u>\$ 8,351,000</u>	<u>\$ 7,535,000</u>



PANARCTIC OILS LTD.

Notes to Financial Statements

December 31, 1977

1. Accounting policies:

Inventory of Supplies

Inventories are recorded at average laid down cost in the Arctic.

Equipment

Equipment is being depreciated over its estimated useful life by the straight-line method, mainly at the rate of 20%.

Exploration expenditures

The activities of the Company are in the exploratory stage and all expenses less sundry income have been capitalized; the Company is deemed to have earned no profit and sustained no loss and therefore no statement of profit and loss is submitted.

Pension Plan

The Company has a contributory pension plan covering substantially all employees. Company costs of the plan are charged to operations currently and funded on the basis of actuarial valuations made at least every three years. Cost of any improvements in benefits created by revisions to the plan are amortized over 15 years.

2. Equipment:

	December 31, 1977			Net book value December 31 1976
	Cost	Accumulated depreciation	Net book value	
Mobile equipment	\$ 3,005,000	\$1,538,000	\$1,467,000	\$1,716,000
Buildings	3,125,000	1,658,000	1,467,000	324,000
Storage facilities	2,125,000	1,920,000	205,000	87,000
Radio and navigational equipment	1,111,000	776,000	335,000	199,000
Production equipment	2,142,000	—	2,142,000	425,000
Other	4,452,000	1,779,000	2,673,000	1,225,000
	<u>\$15,960,000</u>	<u>\$7,671,000</u>	<u>\$8,289,000</u>	<u>\$3,976,000</u>

Depreciation recorded in 1977 and capitalized as Exploration expense amounted to \$1,387,000 (1976 — \$1,459,000).

3. Income taxes:

By agreement the Company has undertaken that it will not claim for income tax purposes expenditures which would otherwise be deductible under the Income Tax Act until the aggregate amounts of such expenditures, together with 45% of the Company's non-deductible amounts, is equal to the \$80 million cash investments made by the Government of Canada. The Company has also undertaken to waive forever all claim to a deduction in respect of such allowable deductions.



4. Long-term debt:

	<u>1977</u>	<u>1976</u>
Bank loans due 1978 - 1981, unsecured, interest at the bank prime rate plus $\frac{3}{4}\%$	\$ 2,822,000	\$ 1,549,000
Bank loans and accrued interest due Nov. 30, 1980, guaranteed by the Government of Canada, interest at the bank prime rate plus $\frac{1}{2}\%$, compounded quarterly	14,567,000	13,326,000
	17,389,000	14,875,000
Less current portion	1,226,000	726,000
	<u>\$16,163,000</u>	<u>\$14,149,000</u>

With respect to the \$14,567,000 bank loans guaranteed by the Government of Canada, should the Government be called upon to honour the guarantee in 1980, the loan together with accrued interest may be converted into common shares of the Company at \$12.50 per share or the price received by the Company for shares in the financing immediately preceding such conversion, whichever is the lesser. The Company pays a guarantee fee of 1% per annum on the principal amount and accrued interest.

Payments required under the unsecured loans are as follows:

1978 — \$1,226,000; 1979 — \$596,000; 1980 — \$500,000; 1981 — \$500,000.

5. Share capital:

	<u>Number of shares</u>	
Balance January 1, 1977	40,900,100	\$170,376,000
Additional common shares issued		
To the Government of Canada for cash	149,495	1,869,000
To shareholders in consideration for an undertaking to incur expenditures in the conduct of exploration operations on company lands	2,650,505	33,131,000
To a shareholder in consideration for expenditures in conduct of exploration operations on company lands	813,931	10,174,000
Balance December 31, 1977	<u>44,514,031</u>	<u>\$215,550,000</u>

Of the authorized but unissued common shares 10,947,863 were reserved at December 31, 1977 for the following:

- (a) Outstanding warrants which entitle the holders thereof to purchase an aggregate of 6,800,000 additional common shares at \$1 per share. The warrants are exercisable under certain circumstances during a five year period after 1980 and expire in any event on January 1, 1991.
- (b) Conversion of long-term debt for which 2,500,000 shares are reserved.
- (c) Issuance of 1,627,863 shares pursuant to an agreement dated December 3, 1976. This agreement provides for another company to incur \$30,522,425 in exploration expenditures on company lands over a three year period ending December 31, 1979 in consideration for 2,441,794 shares. In 1977, 813,931 shares were issued relating to 1977 expenditures incurred under the agreement.
- (d) Issuance under the employees' share incentive plan (20,000 shares).



6. Pension plan:

Based on the actuarial report dated December 31, 1976 there was no unfunded liability. In 1977 changes to the plan to be effective January 1, 1978 were approved which improves the pension benefits allowed under the plan. It is estimated that the unfunded past service liability resulting from these changes is \$240,000 and will be funded as outlined in Note 1.

7. Commitments:

The Company is committed to make minimum future payments of approximately \$1,500,000 over each of the next five years for rental of office space and aircraft and the contracting of a drilling rig.

8. Statutory information:

During 1977 there were 26 directors including 6 past directors, and 12 officers including 3 past officers, of whom 4 were also directors.

No directors' fees were paid in 1977 or 1976. Officers' remuneration for 1977 and 1976 amounted to \$333,000 and \$311,000 respectively.

9. Statement presentation:

Certain items in the 1976 financial statements have been reclassified to conform to the presentation adopted in the current year.

AUDITORS' REPORT

To the Shareholders of
Panarctic Oils Ltd.

We have examined the balance sheet of Panarctic Oils Ltd. as at December 31, 1977 and the statements of exploration expenditures capitalized and changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the financial position of the Company as at December 31, 1977 and the results of its operations and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

As explained in Note 1 to the financial statements the Company's activities are still in the exploratory stage and all expenses, less income, have been capitalized from inception to December 31, 1977. The Company is deemed to have realized no profit and sustained no loss to December 31, 1977 and therefore no profit or loss account is submitted.

CALGARY, ALBERTA
February 24, 1978

Price Waterhouse & Co.
Chartered Accountants



DIRECTORS

As at April 30, 1978

Willie Adams

Senator
The Senate of Canada
Ottawa, Ontario

***Joel I. Bell**

Senior Vice-President
Finance and Planning
Petro-Canada
Calgary, Alberta

R. G. Brawn

President
Turbo Resources Limited
Calgary, Alberta

Rod P. Douglas

Group Vice-President
Cominco Ltd.
Yellowknife, N.W.T.

***C. S. Dunkley**

Senior Vice-President
Dome Petroleum Limited
Calgary, Alberta

H. G. Gammell

President
Thor Exploration Company Ltd.
Calgary, Alberta

***Donald S. Harvie**

Deputy Chairman
Petro-Canada
Calgary, Alberta

***Chas. R. Hetherington**

President & Chief
Executive Officer
Panarctic Oils Ltd.
Calgary, Alberta

Richard M. Hill

Arctech Resource Management
Services
Inuvik, N.W.T.

Wilbert H. Hopper

President & Chief
Executive Officer
Petro-Canada
Calgary, Alberta

***D. C. McGavin**

Secretary
Inco Limited
Toronto, Ontario

***R. A. Meneley**

Vice-President
Exploration
Petro-Canada Exploration Inc.
Calgary, Alberta

Dr. Robert L. Purvin

President
Barber Oil Corporation
New York, New York

B. B. Rombough

Executive Vice-President
PanCanadian Petroleum Limited
Calgary, Alberta

***S. M. Rothman**

Vice-President
Cominco Ltd.
Vancouver, B.C.

W. S. Row

Former Chairman of the Board
Noranda Mines Limited
Toronto, Ontario

Louis P. Starck

President & Managing Director
G M Resources Limited
Calgary, Alberta

***John M. Taylor**

President
PanCanadian Petroleum Limited
Calgary, Alberta

Michel Vennat

Partner
Stikeman, Elliott, Tamaki & Robb
Montreal, Quebec

P. David Williams

President
Westburne Petroleum & Minerals
Limited
Calgary, Alberta

*Members of the Executive
Committee of the Board of Directors

OFFICERS

As at April 30, 1978

Chairman of the Board

JOHN M. TAYLOR
President
PanCanadian Petroleum Limited

Vice-Chairman of the Board

W. H. HOPPER
President & Chief
Executive Officer
Petro-Canada

President & Chief

Executive Officer
CHAS. R. HETHERINGTON
Panarctic Oils Ltd.

Vice-President — Exploration

D. C. WAYLETT
Panarctic Oils Ltd.

Vice-President — Operations

L. J. FRANKLIN
Panarctic Oils Ltd.

Vice-President — Land & Administration

R. G. S. CURRIE
Panarctic Oils Ltd.

Treasurer and Comptroller

H. W. JOHNSON
Panarctic Oils Ltd.

Secretary and General Counsel

W. G. HOLT
Panarctic Oils Ltd.

Assistant Secretary

F. R. MATTHEWS, Q.C.
MacKimmie Matthews

PANARCTIC OILS LTD.

Incorporated May 27, 1966, by Federal
Letters Patent

HEAD OFFICE

703 Sixth Avenue South West,
Calgary, Alberta
T2P 0T9



SUMMARY OF SHAREHOLDERS

As at December 31, 1977

	COMMON SHARES
Petro-Canada Exploration Inc.	20,176,019
PanCanadian Petroleum Limited	3,974,375
Cominco Ltd.	3,898,794
Inco Limited	2,151,132
Noranda Mines Limited	1,999,940
Dome Petroleum Limited	1,878,611
Barber Oil Northern, Inc.	1,870,318
G M Resources Limited	1,743,424
Thor Exploration Company Ltd.	1,587,322
Home Oil Company Limited	971,677
Westburne Petroleum & Minerals Ltd.	830,005
Bankeno Mines Limited	829,111
Bow Valley Industries Ltd.	829,110
Dome Mines Limited	355,538
Ashland Oil Canada Limited	348,187
Norcen Energy Resources Limited	336,612
Campbell Red Lake Mines Limited	177,827
Conick Petroleums Limited	130,000
Conventures Limited	83,000
Sigma Mines (Quebec) Limited	59,344
E. Connelly	41,463
Alminex Limited	15,100
Canadian Homestead Oils Limited	8,140
Pembina Pipe Line Ltd.	5,835
Lassiter Kuma Oils Ltd.	5,622
Golden Eagle Oil & Gas Limited	5,190
Luscar Ltd.	2,000
Place Gas & Oil Company Limited	2,000
Tanner Arctic Oil Ltd.	1,810
Castle Oil & Gas Limited	1,293
Estate of James E. Day	1,000
Canadian Moran Ltd.	232
Other	194,000
	44,514,031

BACK COVER PHOTO

Drake F-76 Flowline Bundle on makeup rollers, onshore, prior to being pulled offshore into the vicinity of the subsea wellhead.

